

**STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION**

COMMONWEALTH EDISON COMPANY)	
)	Docket No. 12-0298
Petition for Statutory Approval of a Smart)	
Grid Advanced Metering Infrastructure)	
Deployment Plan pursuant to Section)	
16-108.6 of the Public Utilities Act)	

**INITIAL BRIEF OF THE CITIZENS UTILITY BOARD AND
THE ENVIRONMENTAL LAW AND POLICY CENTER**

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I. INTRODUCTION

Now come the Citizens Utility Board (“CUB”) and the Environmental Law and Policy Center (“ELPC”), pursuant to the Rules of Practice of the Illinois Commerce Commission (“ICC” of “the Commission”), 83 Ill. Admin. Code Part 200, and pursuant to the briefing schedule established by the Administrative Law Judge (“ALJ”), to file this Initial Brief in the above captioned proceeding. This proceeding is a review of the proposed Smart Grid Advanced Metering Infrastructure Deployment Plan (“AMI Plan”) filed by the the Commonwealth Edison Company (“ComEd” or “the Company”) under Section 16-108.6 of the Public Utilities Act (“PUA”) on April 23, 2012. Under the new Energy Infrastructure Modernization Act (“EIMA”), Public Act 97-616, ad modified by Public Act 97-646, ComEd is now obligated to invest \$1,300,000,000 in transmission and distribution infrastructure and in “Smart Grid electric system upgrades,” as a result of the Company’s election to recover its delivery services under a performance-based formula rate tariff. 220 ILCS 5/16-108.5(b)(1)(B). ComEd’s AMI Plan is the Company’s proposal to guide those multi-billion dollar investments.

CUB/ELPC witness Miriam Horn testified that ComEd can take additional steps beyond this initial Plan to maximize the consumer and environmental benefits from the deployment of new Smart Grid energy infrastructure, including the deployment of Advanced Metering Infrastructure (“AMI”). CUB/ELPC Ex. 1.0 REV. at 20-21. As Manager of the Environmental Defense Fund’s (“EDF”) Smart Grid Initiative, Ms. Horn has worked with utilities and key stakeholders in Texas, North Carolina, and California to enable greater consumer and environmental benefits from the deployment of Smart Grid technologies. *Id.* at 3-6. As a result of that experience, Ms. Horn proposed specific modifications to ComEd’s AMI Plan that should be adopted by the Commission . *Id.* at 7, 20.

II. OVERVIEW OF SECTION 16-108.6 OF THE PUBLIC UTILITIES ACT

In passing the EIMA, the General Assembly stated it was “the policy of this State that significant investments must be made in the State’s electric grid over the next decade to modernize and upgrade transmission and distribution facilities in the State.” Public Act 97-0616 at 220 ILCS 5/16-108.5(a). By encouraging these investments, the General Assembly hoped to

ensure that the State’s electric utility infrastructure will promote future economic development in the State and that the State’s electric utilities will be able to continue to provide quality electric service to their customers, including innovative technological offerings that will enhance customer experience and choice. *Id.*

The Commission must come to two independent conclusions in order to approve ComEd’s AMI Plan. First, the Commission must find that the AMI Plan contains the information required under the law, including a description of ComEd’s Smart Grid AMI vision which shows consistency with the goal of developing a cost-beneficial Smart grid; a statement of ComEd’s Smart Grid AMI strategy; a deployment schedule and plan; annual milestones and metrics to measure the Plan’s success; and a consumer education plan. 220 ILCS 5/16-108.6(c).

Second, the Commission must conclude that ComEd’s plan, if implemented, would be cost-beneficial for ComEd’s customers “consistent with the principles established through the Illinois Smart Grid Collaborative, giving weight to the results of any Commission-approved pilot designed to examine the benefits and costs of AMI deployment.” 220 ILCS 5/16-108.6(c).

“Cost-beneficial” is defined in the law as where the benefits of ComEd’s AMI Plan exceed the costs of the AMI Plan as initially filed with the Commission or as subsequently modified by the Commission. 220 ILCS 5/16-108.6(a). Total costs for the purposes of this test include all utility costs “reasonably associated” with AMI Plan; total benefits include

avoided utility operational costs, avoided consumer power, capacity, and energy costs, and avoided societal costs associated with the production and consumption of electricity, as well as other societal benefits, including the greater integration of renewable and distributed power resources, reductions in the emissions of harmful pollutants and associated avoided health-related costs, other benefits associated with energy efficiency measures, demand-response activities, and the enabling of greater penetration of alternative fuel vehicles. 220 ILCS 5/16-108.6(a).

The ICC has broad authority under the PUA, including the new legislation, to oversee ComEd's AMI investments and deployment. Within this grant of general authority comes an express duty to exercise general supervision over all Illinois public utilities in accordance with the provisions of the PUA. *Sheffler v. Commonwealth Edison Co.* 399 Ill. App. 3d 51, 60 (1st Dist. 2010), *citing* 220 ILCS 5/4–101. The PUA specifically provides that the Commission “shall have general supervision of all public utilities” including,

the manner in which their plants, equipment and other property ... are managed, conducted and operated, not only with respect to the adequacy, security and accommodation afforded by their service but also with respect to their compliance with this Act and any other law, with the orders of the Commission and with the charter and franchise requirements. *Sheffler*, 399 Ill. App. 3d at 60.

Courts have recognized that within this supervisory framework, the ICC has “broad ratemaking authority” which includes Commission discretion to “formulate reasonable methods of achieving stated legislative objectives.” *Abbott Laboratories, Inc. v. Ill. Commerce Comm'n*, 289 Ill. App. 3d 705, 712 (1st Dist. 1997).

Within the framework of the EIMA, the General Assembly gave the ICC express authority to modify ComEd's AMI Plan. 220 ILCS 5/16-108.5(f-5). When approving or modifying utility proposals, the ICC has authority under the PUA to impose additional obligations on the utility even where those obligations are not enumerated within the statute. *See, e.g.* 220 ILCS 5/16-105 (“approving, or approving as modified” a utility's delivery services implementation plan).

The ICC has made it clear that as a regulatory agency, it is concerned how such Smart Grid investments can be best deployed to offer benefits for utility customers:

[W]ithout an overall plan for smart grid deployment and without any specific projects being proposed, the Commission does not know the extent of the costs and benefits involved . . . The estimates of costs in the record have varied greatly and the estimates of benefits have been sporadic at best. This lack of cost and benefit information is a problem that is not overcome by the process proposed for Commission pre-approval of specific projects. ICC Docket No. 07-0566, Final Order at 138 (Sept. 10, 2008).

Indeed, the Commission recently reaffirmed its commitment to maximize consumer and environmental benefits from Smart Grid investments by “strongly encourag[ing] all parties to work together to find ways to ensure that customers receive the maximum benefits of the proposed investments.” Final Order at 29, Ill. Commerce Comm’n Docket No. 11-0772 (Apr. 4, 2012). The Commission also noted that it may initiate an investigation to consider appropriate actions to ensure “the full realization of the consumer, environmental and societal benefits of [AMI investments].” *Id.* Thus, it is clear that the ICC has proactively taken on its proper role to maximize benefits from Smart Grid investments.

CUB and ELPC agree, as Ms. Horn stated, that the EIMA reflects broader changes in the electric industry. As Ms. Horn testified, in the coming decades, the U.S. electric industry is poised to invest trillions of dollars in technology that will transform our electric system from an antiquated 19th century network to a 21st century network with radically different capabilities. CUB/ELPC Ex. 1.0 REV. at 6-7. Those investments have the power to transform the way we generate and consume electricity. *Id.* Fundamentally, the EIMA recognizes that the smart grid is an enabler for flexible demand, storage and grid awareness technologies can enable the interconnection of far more variable renewable generation and can make it possible to charge plug-in electric vehicles (“EVs”) without compromising grid stability. *Id.* As such, it can

facilitate the emergence of a fundamentally different kind of electric system – one that is structured around distributed resources, including variable renewables; one with far more small players and one deeply integrated with transportation. *Id.*

III. COMMONWEALTH EDISON COMPANY’S AMI PLAN PROPOSAL

A. Deployment Schedule and Plan

ComEd’s proposed deployment schedule and plan fails to maximize customer and environmental benefits achievable from AMI deployment. CUB/ELPC Ex. 1.0 REV. at 13; 220 ILCS 5/16-108.6(c)(3). The need to deploy AMI so that more customer and environmental benefits could be achieved sooner are discussed in detail in Section III (C) below.

B. Annual Milestones and Metrics

The PUA requires that an AMI Plan contain “annual milestones and metrics for the purposes of measuring the success of the AMI Plan in enabling Smart Grid functions; and enhancing consumer benefits from Smart Grid AMI.” 220 ILCS 5/16-108.6(c)(4). In turn, Smart Grid functions listed in the PUA include nine specifically enumerated abilities that Smart Grid investments should enable. *See* 220 ILCS 5/16-108.6(a). ComEd’s proposed milestones and metrics offer a good starting point for the Commission to measure the Company’s performance as well as its AMI investments’ ability to deliver benefits to consumers. ComEd AMI Plan at 75-78. However, these metrics alone fail to adequately address AMI’s abilities to deliver operational and direct customer benefits to all ratepayers in ComEd’s service territory. CUB/ELPC Ex. 1.0 REV. at 17-20. Ms. Horn testified that a lack of clearly defined milestones and metrics risks an overemphasis on expenditure amounts as opposed to performance outcomes. CUB/ELPC Ex. 1.0 REV. at 18. Leveraging her experience in developing collaborative metrics

with investor-owned utilities in California, Ms. Horn formulated a list of tracking measures focused on economic, environmental, and reliability benefits potentially deliverable by Smart Grid investment. *Id.* at 18-19. Importantly, Ms. Horn testified that the list of agreed tracking measures provide a good starting point for an “on-going and collaborative process.” *Id.* at 19.

CUB and ELPC were not the only party to suggest additional measurements to track ComEd’s performance in the deployment of AMI. AARP/AG witness Barbara Alexander proposed adoption of several metrics and reporting requirements adopted in a Maryland proceeding regarding AMI investments. AARP-AG Ex. 1.0 at 20. While many of the AARP/AG proposed metrics closely track the type of information that will be measured by ComEd under the agreed-upon tracking measures listed below, some of the Maryland metrics do not apply to ComEd’s service territory. *See e.g.* AARP-AG Ex. 1.4 at 10-11 (AMI gas modules) (DOE grants). The City of Chicago’s witness Karen Weigert testified that ComEd should measure AMI related programs from a customer perspective to allow informed assessments of the effectiveness of ComEd’s AMI investments. City Ex. 1.0 at 16-17. Ms. Weigert recommended revisions to ComEd’s AMI Plan to include measurements of meter installation, customer enrollment in alternative dynamic-pricing rate structures, meter devices sending or receiving grid related signals, load reductions enabled by demand response, number and capacity of distributed generation systems, load factor, customer complaints, and other measures related to ComEd’s performance and the Smart Grid-enabled customer experience. *Id.* at 18-19.

Therefore, CUB and ELPC proposed a list of additional tracking measure, which ComEd has agreed to track and report, for the Commission to use in measuring the delivery of tangible benefits to consumers as it undertakes the investments pursuant to the AMI Plan. CUB/ELPC Ex. 1.2 REV.; ComEd Ex. 7.0 CORR. at 16-17. ComEd witness Louis Harris testified that the

agreed-upon tracking measures are workable; related to ComEd’s performance or external factors that ComEd should consider; and reasonable and meaningful to measure as “part of the continuing review of the progress of the AMI Plan.” ComEd Ex. 7.0 CORR. at 16. Although not exactly the same, the list of agreed-upon metrics in the table below closely resembles most of the measures recommended by Ms. Weigert and incorporates several addressed by Ms.

Alexander, and reflect what ComEd has agreed to operationalize over the coming months:

No.	Issue	Operational Tracking Measure
1	Customers enrolled in Peak Time Rebate, Real Time Pricing, and other dynamic/time variant prices	<p><u>Residential Customers</u></p> <p>1. Number of customers on a time-variant or dynamic pricing tariff offered by ComEd. Expressed also as a percentage of customers in each delivery class.</p> <p>2. Number of customers served by retail electric suppliers for which the supplier has requested monthly Electronic Data Interchange delivery of interval data. Expressed also as a percentage of customers taking supply from a retail electric supplier in each delivery class.</p> <p><u>Small Commercial Customers</u></p> <p>1. Number of customers on a time-variant or dynamic pricing tariff offered by ComEd. Expressed also as a percentage of customers in the delivery class.</p> <p>2. Number of customers served by retail electric suppliers for which the supplier has requested monthly Electronic Data Interchange delivery of interval data. Expressed also as a percentage of customers taking supply from a retail electric supplier in the delivery class.</p>
2	Customer-side-of-the-meter devices sending or receiving grid related signals	Number of ComEd AMI meters with consumer devices registered to operate with the Home Area Network (HAN) chip by tariffs under which customer receives delivery.
3	AMI Meter failures	<p>Number of advanced meter malfunctions where customer electric service is disrupted.</p> <p>A “malfunction” is a malfunction that causes the meter to become inoperable but does not include cases of tampering, service panel and service entry equipment, house fires, etc.</p>

No.	Issue	Operational Tracking Measure
4	AMI Meters replaced before the end of their expected useful life	<p>Number of ComEd advanced meters replaced annually before the end of their expected useful life, including reasons for replacement that include ComEd errors.</p> <p>“Replaced” means a replacement due to a malfunction that causes the meter to become inoperable, including tampering.</p>
5	Customers with net metering	<p>Number of customers enrolled on Net Metering tariff and net load of each customer.</p>
6	Customer premises capable of receiving information from the grid	<p>Number of installed AMI Meters as of the last day of the calendar year that communicate back to the head end system.</p> <p>Number of installed AMI Meters as of the last day of the calendar year that communicate back to the head end system, divided by the total number of AMI meters installed.</p> <p>Number of customers who have accessed the web-based portal as of the last day of the calendar year as a percentage of customers with AMI Meters and as a percentage of ComEd customers in that delivery class.</p> <p>Number of customers who can directly access their usage data as of the last of the calendar year as a percentage of customers with AMI Meters and as a percentage of ComEd customers in that delivery class</p>
7	Peak load reductions enabled by demand response programs	<p>Load impact in MW of peak load reduction from the summer peak due to AMI enabled, ComEd administered demand response programs such as the Peak Time Rebate program as a percentage of all demand response in ComEd’s portfolio.</p>
8	Customer Complaints	<p>Number of formal ICC complaints, informal ICC complaints, and complaints escalated to ComEd’s customer relations department related to AMI Meter deployment, broken down by type of complaint and resolution. AMI Meter deployment includes AMI Meter installation, functioning or accuracy of the AMI meter, and HAN device registration.</p>
9	Reduction in Greenhouse Gas Emissions enabled by smart grid	<p>ComEd will work collaboratively with CUB and EDF to operationalize this measure.</p>
10	Distributed generation projects	<p>Number of locations and total MWs of customer owned distributed generation connected to the transmission or distribution system, broken down by connection to transmission and distribution system.</p> <p>“Distributed generation” locations are those where customers take service under Rider POG or POG-NM or successor tariffs.</p>

No.	Issue	Operational Tracking Measure
11	Load served by distributed resources	Total sales of electricity to the grid from distributed generation (Rider POG or POG-NM customers) divided by zone energy plus distributed generation sales, with all data provided in sortable format.
12	System load factor and load factor by customer class	Total annual consumption for AMI meters (including, separately, small commercial customers) divided by the average demand across all AMI meters over the 4 peak hours multiplied by 8760 hours by customer class. ComEd will work collaboratively with CUB and EDF to establish a similar measure for all system load.
13	Products with end-to-end interoperability certification	ComEd will conduct an annual survey through a third-party provider to evaluate how products are being introduced in the smart grid enabled marketplace.
14	Network nodes and customer interfaces monitored in “real time”	ComEd will work collaboratively with CUB and EDF to operationalize this measure.
15	Grid connected energy storage interconnected to utility facilities at the transmission or distribution system level	Number of locations and total MWs of utility-owned or operated energy storage interconnected to the transmission or distribution system as measured at storage device electricity output terminals. ComEd will conduct an annual survey through a third-party provider to estimate similar measures of non-utility storage units.
16	Time required to connect distributed resources to grid	ComEd’s response time to a distributed resource project application, and time from receipt of application until energy flows from project to grid.
17	Voltage and VAR controls	Number and percentage of distribution lines using sensing from an AMI meter as part of ComEd’s voltage regulation scheme.
18	Grid assets that are monitored, controlled, or automated	Number and percentage of ComEd substations (Distribution Center Substations (DCs), Substations (SSs) Transmission Substations (TSSs) and Transmission Distribution Centers (TDCs)) monitored or controlled via Supervisory Control and Data Acquisition (SCADA) systems. Number and percentage of ComEd distribution circuits (4kV, 12kV and 34kV) equipped with automation or remote control equipment including monitor or control via Supervisory Control and Data Acquisition (SCADA) systems.

No.	Issue	Operational Tracking Measure
19	Customers connected per automated circuit segment	<p>Average number of customers per automated three phase 12kV line segment.</p> <p>An “automated line segment” is a segment of 12 kV three phase mainline circuit between automated devices which include circuit breakers, reclosers, automated switches, etc.</p> <p>A “customer” is a ComEd account connected on the automated 12kV three phase line segment.</p>
20	Improvement in line loss reductions enabled by smart grid technology	ComEd will research the uncertainty in line loss measurement collaboratively with CUB and EDF.

CUB/ELPC Ex. 1.2 REV.

The Commission’s Final Order in ComEd’s performance metrics docket, decided under Section 16-108.5(f) and (f-5) of the PUA, recognized the importance of tracking measures like the ones proposed by CUB/ELPC in this proceeding. In the performance metrics case, the Commission noted that “some of the CUB/City proposed metrics clearly relate to AMI deployment,” and to the extent that those AMI related metrics contained “good ideas concerning important additional metrics,” the Commission “strongly encourage[d] all parties to work together to find ways to ensure that customers receive the maximum benefits of the proposed investments.” Final Order at 29, Ill. Commerce Comm’n Docket No. 11-0772 (Apr. 4, 2012). Specifically, the Commission suggested that “to the extent CUB/City’s proposed metrics relate to the deployment of AMI meters, that parties consider those metrics in the forthcoming proceeding on ComEd’s AMI deployment plan.” *Id.* After receiving a Staff Report to review the metrics approved in this proceeding and in the performance metrics proceeding, the Commission may initiate an investigation to consider appropriate actions to ensure “the full realization of the consumer, environmental and societal benefits of [AMI investments].” *Id.*

Staff witness Dr. Schlaf testified that ComEd's AMI Plan would be improved through identification of specific metrics that ComEd intends to track and report. Staff Ex. 1.0 at 10. In accordance with the Final Order in ICC Docket 11-0772, Dr. Schlaf also testified that ComEd should identify which of the AMI-related metrics proposed by CUB/City in the performance metrics docket would be relevant to measuring and tracking ComEd's AMI deployment. *Id.*

Since the Company has agreed to incorporate the agreed-upon list of tracking measures listed above in its AMI Plan, the Commission should order ComEd to modify its AMI Plan to include the list of tracking measures listed above. The Commission should then require ComEd to include in its next annual AMI Plan update a baseline for each measure, which can be updated in each annual filing to ensure reasonable progress with respect to the identified tracking measures. *See* 220 ILCS 5/16-108.6(e)(3).

ComEd's AMI Plan, even as so modified, should not be understood to be complete and sufficient for the life of the AMI deployment. CUB/ELPC Ex. 1.0 REV. at 21. Smart grid deployment and its resulting benefits is an area of evolving interest – one where changing technology, market characteristics, regulatory requirements, emerging applications and locally unique conditions will continue to shape the landscape in real time. *Id.* Therefore, the approval of this plan should be seen as the beginning, not the end, of the Commission's involvement and interest in ComEd's smart grid deployment. *Id.* The types of tracking measures agreed to by ComEd will help facilitate annual reviews and stakeholder discussions which can continue to develop and refine trackers for smart grid functions as the salience of the various functions, and the particular challenges relevant in ComEd's service territory, become clear over time. *Id.*

C. Cost-Benefit Requirement

In order to approve ComEd's AMI Plan, the PUA requires that the Commission find that implementation of the AMI Plan will be cost-beneficial consistent with the principles established through the Illinois Smart Grid Collaborative ("ISGC"), giving weight to the results of any Commission-approved pilot designed to examine the benefits and costs of AMI deployment. 220 ILCS 5/16-108.6(c). An AMI Plan is cost-beneficial if the present value of the total benefits of the Smart Grid AMI Deployment Plan exceeds the present value of the total costs of the Smart Grid AMI Deployment Plan. Total benefits include avoided utility operational costs, avoided consumer power, capacity, and energy costs, avoided societal costs associated with production and consumption of electricity, the greater integration of renewable and distributed power resources, reductions in the emissions of harmful pollutants, benefits associated with energy efficiency measures, and demand-response activities. 220 ILCS 5/16-108.6(a).

CUB and ELPC testified that the Company's proposed deployment schedule does not maximize benefits for consumers who pay for AMI investments beginning in Year 1 of the deployment schedule but who do not receive an AMI meter until later years of the Plan. The ISGC Collaborative Report recommended that "a cost-benefit assessment of smart grid investments and approaches should include discussion of the potential change in benefits and costs that may occur over time assuming various implementation schedules." ISGC Collaborative Report at 231-232 (Sept. 30, 2010). Indeed, the ISGC Collaborative Report notes that consensus was achieved regarding the requirement for a cost-benefit filing to discuss "the potential change in benefits and costs that may occur over time assuming various implementation schedules." *Id.* at 250. The Commission has already asked stakeholders to "work together to find ways to ensure that customers receive the *maximum* benefits of the proposed investments,"

concluding it might initiate an investigation to consider appropriate actions to ensure “the *full realization* of the consumer, environmental and societal benefits of [AMI investments].” Final Order at 29, Ill. Commerce Comm’n Docket No. 11-0772 (Apr. 4, 2012) (emphasis added).

Additionally, Black & Veatch’s evaluation of ComEd’s Commission-approved pilot found that implementation of AMI throughout the ComEd service territory over a five-year deployment scenario as opposed to a ten-year deployment scenario would increase the Net Present Value to ComEd’s customers by \$144 million and would reduce the customer perspective payback period from nine years to eight. Black & Veatch, *Advanced Metering Infrastructure (AMI) Evaluation Final Report* at 2 (July 2011). Importantly, the evaluation notes that “the costs to implement and operate the AMI system vary only minimally between five-year and ten-year deployment scenarios. There is relatively more difference in the estimated benefits with the switch between a five-year or ten-year deployment.” *Id.* at 17-18. Black & Veatch concludes that the “stretching out” of costs and benefits between the ten and five year scenarios “tends to reduce the overall project value, by around 15%.” *Id.* at 37 (noting that the relationship is largely linear, i.e. a one-year delay reduces overall project value by 3%).

ComEd’s proposed AMI Plan calls for deployment to all of its customers over a 10-year deployment schedule. ComEd AMI Plan at 21-22. The AMI Plan claims that the schedule results, in part, from “a desire to balance achievement of operational efficiencies, *minimize* costs to customers, and *maximize* participation of customers in and the peak-time rebate program.” *Id.* (emphasis added). Throughout the AMI Plan, ComEd implicitly acknowledges the desire to maximize consumer benefits (as opposed to only simply *exceeding* costs) with proposals to ensure that “the technology is *optimized*” and to ensure that “[p]articipation in residential real time pricing and direct load control programs tends to be *highest*.” *Id.* at 22 (emphasis added).

Based upon this proposed ten-year deployment schedule, ComEd witness Richard O’Toole testified that there “is no reason to delay the installation of AMI meters and the customer benefits accompanying that installation when ComEd has already successfully piloted the proven technology provided by [Silver Springs Networks].” ComEd. Ex. 2.0 REV. at 13-14. Mr. O’Toole testified that under the proposed AMI Plan, ComEd intends to install approximately 385,000 meters in 2013; approximately 536,000 meters in 2014; then gradually reduce the number of meters installed annually to approximately 289,000 in 2021. *Id.* at 14-15. Mr. O’Toole noted that “[c]onverting an operating center over to all AMI meters *as soon as possible* shortens the transition period for the field forces operating under both old and new work processes.” *Id.* at 16 (emphasis added).

To develop the benefits used by Black & Veatch to perform the cost-benefit analysis of ComEd’s proposed AMI Plan (ComEd Exhibit 6.02 Revised), Mr. O’Toole testified that he provided the values for the inputs into Black & Veatch’s benefit model. TR at 181:15-17. Of the first eight inputs ComEd identified as directly related to AMI installation, all eight realize their full annual value “after all the AMI meters are installed,” regardless of when full installation of ComEd’s meters is completed. ComEd Ex. 2.0 REV. at 52-55; TR at 183:1-184:3. This total annual benefit, according to ComEd and Black & Veatch, is as follows:

Benefit Input	Annual Benefit Value¹	Total Benefit Value in Steady State (post-deployment)²	Benefit Realization Schedule
Meter Reading	\$52 million	\$78.8 million	Proportional to Meter deployment ³
Field and Metering	Reduction of 69	\$18.3 million	Difference in As-Is

¹ ComEd Ex. 2.0 REV. at 52-55.

² ComEd Ex. 6.02 REV. at 4-8.

³ ComEd Ex. 6.02 REV. at C-12.

Benefit Input	Annual Benefit Value¹	Total Benefit Value in Steady State (post-deployment)²	Benefit Realization Schedule
Services	employees		versus To-Be full time employees ⁴ (rough proportion to Meter deployment) ⁵
Billing Staffing	Reduction of 16 employees	\$4.2 million	Based on full meter deployment schedule ⁶
Call Center Staffing	Reduction of 1 employee	\$179.3 million	Proportional to Meter deployment ⁷
Outage Management	\$3.2 million	\$4.6 million	Proportional to Meter deployment but dependent on business process changes ⁸
Consumption on Inactive Meters	\$51.9 million	\$78.9 million	Proportional to Meter deployment ⁹
Unaccounted for Energy	\$52.5 million	\$56.8 million	Proportional to Meter deployment ¹⁰
Net Bad Debt Expense	\$30.5 million	\$43.8 million	Proportional to Meter deployment ¹¹

After the AMI system is fully installed, benefits from ComEd’s operational savings alone exceed costs to deploy the AMI system by at least \$45 million, and total savings generated by AMI investments at that same point in time are projected to annually exceed costs by \$125 million – resulting in an average savings over the 20 year evaluation period of approximately \$25 per meter per year. *Id.* at 6-1; 6-3.

⁴ ComEd Ex. 6.02 REV. at C-15.

⁵ ComEd Ex. 6.02 REV. at C-15,16.

⁶ ComEd Ex. 6.02 REV. at C-22.

⁷ ComEd Ex. 6.02 REV. at C-24.

⁸ ComEd Ex. 6.02 REV. at C-20.

⁹ ComEd Ex. 6.02 REV. at C-5.

¹⁰ ComEd Ex. 6.02 REV. at C-2.

¹¹ ComEd Ex. 6.02 REV. at C-9.

At the request of ComEd, the Black and Veatch cost-benefit analysis evaluated the 20 year costs and benefits based on a single AMI deployment scenario: deployment of meters to 100% of ComEd customers over ten years. ComEd Ex. 6.02 REV. at 1-1. Although sensitivity analyses were performed for other scenarios, a different deployment schedule was not one of the sensitivities evaluated. *Id.* at 1-5. For example, ComEd witness Andrew Trump testified that although at one point ComEd had requested a 5-year deployment schedule evaluation, Black & Veatch did not complete the 5-year deployment model. Tr. at 335:6-15.

An increase in AMI operational efficiencies of ten percent increases the Net Present Value to customers by \$117 million. *Id.* at 1-6. Black and Veatch noted that “in many instances, cost and benefits accrue in proportion to, and at the same rate as, the deployment of Smart Meters.” *Id.* at 2-4. The same analysis concluded that “[i]t may be possible to deploy meters in locations where there is higher benefit impact earlier, thereby advancing benefits and improving value.” *Id.* at B-4, n. 48.

Ms. Horn testified that ComEd’s proposed ten-year deployment schedule raises questions of equity since the performance-based formula rate process imposes the shared cost of AMI investments on all of ComEd’s customers without allowing all customers the benefit of smart grid functionality until the decade-long investment is complete. CUB/ELPC Ex. 1.0 REV. at 13. While it is true that some benefits of AMI deployment accrue even to those customers who do not receive an AMI meter until year 10 of ComEd’s proposed deployment schedule, many benefits “accrue primarily to those customers who actually have the new meters.” *Id.* The Commission should take every opportunity to narrow the gap between when individual ratepayers begin paying for the new system infrastructure, and when they themselves will have direct access to the new technology and the information it provides. *Id.* Requiring ComEd to

deploy its AMI meter as fast as possible, consistent with best practices and other statutory criteria such as residential rate impact requirements, would be the best way to do so.

This is the same recommendation made by the Smart Grid Advisory Council, which concluded that smart grid investments should be made in the fastest timeframe possible that maximize its value while meeting the statutory cost test. ComEd Ex. 7.02 at 7. In the Council's opinion, expedited deployment increases AMI benefits relative to costs and saves money while also providing benefits more equitably and sooner to all customers. *Id.* CUB and ELPC agree with the Council that a decade-long implementation schedule would delay benefits and "exacerbate concerns about the fairness of the rollout schedule and the overall value of Smart Grid investment." *Id.* In addition, the Council observed that, until full deployment, marketing of AMI-enabled products and education of consumers through mass media risks customer confusion and negative responses. *Id.* Thus, the Council concluded that it is "imperative that full deployment be accomplished in the shortest reasonable period." *Id.*

In this case, other parties as well as CUB and ELPC also urged ComEd to consider faster deployment scenarios. The Chief Sustainability Officer for the City of Chicago, Karen Weigart, accepted ComEd's technical and economic justification for its proposed deployment plan but disagreed that deployment should be stretched over an entire decade, and in particular, disagreed it was appropriate to place the Chicago Business District late in deployment. City Exhibit 1.0 at 5. Ms. Weigert reinforced the equity concern expressed by Ms. Horn since "many anticipated benefits of AMI meters will not be available to most customers for years, as the deployment plays out over a decade." *Id.* at 5-6. Ms. Weigert cited the pilot evaluation performed by Black & Veatch for the proposition that "a shorter deployment schedule would reduce the total cost to ratepayers for the AMI meter installations," and as a result, the sooner customers can use the

AMI technology, the sooner those customers can begin to capture the savings that will offset the AMI deployment costs that will be included in ComEd rates. *Id.*

The longer the deployment schedule, the more likely it becomes that a customer might pay for AMI meters without ever receiving one due to moving outside the ComEd service territory. *Id.* at 6-7. For those areas which might present technical challenges, such as the City of Chicago's downtown business district, earlier deployment could allow ComEd more time to identify and remediate such technical difficulties. *Id.*

ComEd "understands CUB/ELPC's and the City of Chicago's rationale for a shorter deployment schedule ... because of the challenges posed by an accelerated deployment, ComEd cannot commit to a faster deployment." ComEd Ex. 8.0 at 7. The challenges identified include accelerated capital and operations & maintenance expenses associated with an accelerated deployment schedule, issues which in ComEd's view cannot be resolved until the 2011 formula rate case and the 2012 formula rate update and reconciliation case are resolved. *Id.* at 7-8. ComEd has committed to remaining flexible throughout the planning process based on ComEd's assessment of the pertinent technical and economic factors. *Id.* at 8.

Giving weight to the results of Black & Veatch's evaluation of ComEd's AMI Pilot, the Commission should require ComEd to formally evaluate a shorter deployment schedule. The Pilot evaluation found an increase of \$144 million in Net Present Value to ComEd's customers from a five-year as opposed to ten-year deployment schedule, reducing the payback period from nine to eight years. Black & Veatch, *Advanced Metering Infrastructure (AMI) Evaluation Final Report* at 2 (July 2011). Although ComEd points to capital and financing concerns as reason to delay accelerating deployment, Black & Veatch's Pilot evaluation found that costs vary minimally in comparison to benefits when it evaluated full deployment over a shorter timeframe.

Id. at 17-18. Indeed, the AMI Pilot evaluation, whose results are specifically named by the PUA as Commission guidance in evaluating an AMI Plan, concluded that a ten-year deployment scenario would decrease the value to ComEd's customers by 15%. *Id.*

ComEd agrees that the maximization of benefits and improvement in overall efficiency is a goal of ComEd's AMI investments. ComEd AMI Plan at 21-22. Of the eight operational benefits identified by Mr. O'Toole and analyzed by Mr. Trump, the greatest value from each benefit realizes upon full deployment and each benefit is at least "roughly" proportional to the number of meters deployed. These characteristics, and the fact that a benefit accrued earlier improves overall value to ComEd's customers, means that ComEd's own data indicates at least \$180 million of operational benefits can be realized each year that full deployment is accelerated. *See* Table above on Page 18. Even Mr. Trump admits that an increase in operational efficiency increases Net Present value and that in "many cases," costs and benefits of AMI investments are in proportion to the number of meters deployed.

The Commission should modify ComEd's Plan as recommended by Ms. Horn, Ms. Weigert, and the Smart Grid Advisory Council with respect to the proposed deployment schedule and plan. The Commission has correctly noted that the focus in approving ComEd's proposed AMI investments should be on fully realizing the maximum amount of consumer benefits. Final Order at 29, Ill. Commerce Comm'n Docket No. 11-0772 (Apr. 4, 2012). As a result, the ICC should require ComEd to propose at least one accelerated deployment scenario in its next annual AMI Plan filing. Failing to do so is not only inconsistent with the consensus reflected in the ISGC Report, it would be not give weight to the results shown in the AMI Pilot and as such, violate the EIMA.

IV. CUB'S PROPOSED MODIFICATIONS

As Ms. Horn testified, the Smart Grid, and in particular, the types of investments identified in the EIMA, can provide great potential benefits for ComEd's customers, but only if designed with clear goals, system-wide planning and opportunities for continuous learning and improvement. CUB/ELC Ex. 1.0 at 10. Potential benefits include:

- Improvements in operational efficiency and system reliability, including reduced metering costs through automated metering and improved asset life through improved information on maintenance issues in wires or in substations, before equipment failures or outages occur. *Id.*
- Consumer benefits through improved usage information and ability to manage energy usage through energy efficiency, demand response and distributed generation investments, not only through expanded rate options that will give additional potential money saving opportunities from energy conservation and load shifting but through new technologies made practicable by smart grid investments. *Id.*
- Economic benefits through the support of new markets and innovation that leverage the infrastructure. Smart grid, and the data that results from its implementation, can create significant opportunities for innovation if the right rules put in place to optimize access and functionality. *Id.*
- Environmental benefits through smarter long-term generation and transmission investments and more efficient resource utilization, avoided greenhouse gas ("GHG") emissions associated with peak energy usage and meter reading, and improved distributed and renewable resource interconnection. *Id.*

Ms. Horn testified that these benefits should be addressed by ComEd in greater detail, and proposed specific recommendations regarding how best to achieve the benefits associated with dynamic pricing programs, demand management technology, distributed generation, and electric vehicle integration. CUB/ELPC Ex. 1.0 REV. at 10, 13

A. Distributed Generation

The EIMA expressly calls for benefits from distributed generation to accrue to ComEd's customers as a result of implementing the Company's AMI Plan. 220 ILCS 5/16-108.6(a). ComEd's AMI Plan acknowledges that direct customer benefits will result from AMI deployment due to the increased ability of customers to receive electricity supply from distributed sources. ComEd AMI Plan at 66-67. CUB and ELPC agree with ComEd – and the

U.S. Department of Energy – that distributed generation can provide a range of direct and indirect benefits to all ComEd customers. CUB/ELPC Ex. 1.0 REV. at 14.

However, as CUB/ELPC witness Horn testifies, ComEd’s customers are unlikely to maximize the potential from distributed generation investments unless barriers to market entry are removed. *Id.* at 15. Some of these barriers are economic, such as lack of good financing options to address the high up-front cost of renewable energy systems. *Id.* Others are technical, such as the level of study required to connect distributed generation to dense, urban areas and the lack of information about suitable interconnection sites. *Id.* While ComEd cannot be expected to address all potential barriers, the Company can – and should – be asked to address the technical barriers which are related to its deployment of AMI. These barriers include (1) a complicated interconnection application process for customers on the radial portion of ComEd’s distribution grid; and (2) a lack of information regarding where distributed generation can cost-effectively interconnect to ComEd’s distribution grid. *Id.*

It is true that Illinois has a set of standardized administrative rules addressing grid interconnection issues. *Id.* As a part of those rules, different levels of review are required for interconnection to ComEd’s distribution grid based on the generating capacity of the customer’s system and the location on ComEd’s system (that is, whether on a radial feeder or a network grid) to which the customer wants to connect to. For interconnection requests on the portion of ComEd’s system referred to as a network grid, interconnection requests are automatically sent to a higher level of study. *Id.* If a customer falls into the higher levels of review, approval of their request to connect to ComEd’s grid can require an expensive and time consuming study – even if the system is small in size and the same study was already performed for similarly situated customers. *Id.*

While the reliability of ComEd's is certainly very important, a de facto policy requiring any sized system on the network grid to go through a time-consuming, unpredictable and potentially expensive process could derail most projects on the network grid, and definitely smaller systems such as residential and small commercial rooftop systems – the very types of investments the EIMA seeks to facilitate. *Id.* Requiring repeated studies of similarly situated interconnection requests seems to discourage adoption of distributed generation in those dense, urban areas on the network grid without serving the end goal of reliability. *Id.* at 16.

The Commission can, and should, address this barrier by re-opening the rulemaking process for interconnection rules with a goal of incorporating well-developed best practices for streamlining approval and interconnection processes. *Id.* At the very least, the customer should be given the option to pay for the incremental level of study required to address the effect of interconnection at their particular location on system reliability instead of paying for a completely new study to be performed. *Id.*

The Commission should also require ComEd to address the second technical barrier: the lack of information about suitable interconnection sites. While distributed generation may be cost-effective for customers in some places on ComEd's grid, in other places it may not be. *Id.* Currently there is no way for a customer to know whether they are in a good location for a distributed generation project without first evaluating a project, contacting a vendor, preparing an interconnection application, filing that application with ComEd and waiting for a response. *Id.* Ms. Horn testified that all of these steps can involve substantial time and resources, which can ultimately have the effect of discouraging customer adoption of distributed generation. *Id.* ComEd can address this problem by publishing information about its distribution grid on its website, for example, showing where the radial grid ends and where the network grid begins, an

important distinction because of variations in the interconnection rules. *Id.* Further, ComEd could publish information on customer areas served by feeders that have already reached the threshold of distributed generation capacity necessitating a higher level of study. *Id.* Nationally, other utilities such as San Diego Gas and Electric and National Grid have published interactive distribution grid maps that provide customers with information that they can use to perform and initial screening of the best places to interconnect distributed generation. *Id.* Doing the same in Illinois would save resources for both ComEd and for its customers, reduce risk for distributed generation developers in site selection, substantially reduce the barriers to interconnection, and help further enable the type of customer and grid benefits of distributed generation that ComEd describes in its AMI Plan. *Id.*

The environmental and economic benefits of distributed generation described in ComEd's AMI Plan can be fully realized if ComEd and the Commission commit to removing technical barriers that customers face in the interconnection process. *Id.* at 17. Without addressing these barriers, it is premature for ComEd to claim that its AMI Plan will result in benefits from greater integration of distributed generation resources.

B. Rate Options

ComEd's proposed AMI Plan fails to maximize the possible direct customer benefits from deployment of AMI investments associated with changes in energy usage encouraged by the new dynamic pricing programs enabled by AMI. While ComEd is required by the EIMA to offer a peak-time rebate tariff ("PTR") within 60 days after approval of this AMI Plan, CUB, ELPC, AARP and the People of the State of Illinois all agree that customer benefits can be maximized only if ComEd's customers are offered a full menu of dynamic pricing options, including an additional "time of use" ("TOU") rate. *See* CUB/ELPC Ex. 1.0 REV. at 12;

AG/AARP Ex. 3.0 at 17-18. AG/AARP witness Rick Hornby offered an example of how a TOU rate would differ from existing rate offerings, and from the PTR required by the EIMA. He testified that under a TOU rate, ComEd would establish on-peak and off-peak periods, and the price for electric supply during on-peak periods would be higher than in off-peak periods. *Id.* at 17. A TOU rate would differ from the existing rate under which the price for supply is the same regardless of when the electricity is used since customers would pay a somewhat higher price for their use during on-peak periods and somewhat lower rates in the off-peak hours. *Id.* at 18. As compared to the existing residential real-time pricing program offered by ComEd, a TOU rate does not change its prices every hour but instead sets prices for the specific peak and off-peak periods for several months at a time. *Id.* Finally, a TOU rate would differ from the proposed PTR by being applicable in all 8,760 hours of the year, in set peak and off-peak periods, and it would be a predictable price for both blocks. *Id.* The PTR only applies about 15 times a year in periods of 6 hours each, for a total of 90 hours per year. Unlike these other rate design options, the idea behind a TOU is that the peak and off-peak periods would remain stable over time, so customers could become familiar with them and set their major appliances accordingly. *Id.* Mr. Hornby also noted that customers have the ability to save more money over a year by taking service under a TOU rate than by participating in PTR. *Id.*

ComEd has already tested this type of rate design in its AMI Pilot through its Customer Applications Pilot, which tested a TOU rate with an on-peak period of weekday afternoons from 1 pm to 5 pm and all other hours being off-peak. *Id.* A new TOU rate would increase the value of the AMI plan to customers who have the flexibility to shift some portion of their use from peak periods to off-peak periods. *Id.* As ComEd itself admits, TOU rates have proven very popular elsewhere, for example in Arizona, where the Arizona Public Service and Salt River

Project have achieved cumulative participation rates in their residential TOU rates of about 51 percent and 28 percent respectively. *Id.*, citing ComEd Ex. 5.02 at 8.

CUB and ELPC believe that the ComEd AMI Plan would be more likely to succeed in achieving these projected benefits if more innovative rate options were included. To ensure that customer and system benefits are maximized, Ms. Horn testified that other dynamic rate structures, including a TOU, should be included in the rollout. CUB/ELPC Ex. 1.0 REV. at 12. A full menu of dynamic pricing options important to deliver benefits to ComEd's customers because it will allow for customers to choose the rate structure which best fits their needs and maximizes their service experience with the utility. *Id.* A full menu also increases the likelihood that any one customer will participate in dynamic pricing, since customers have the ability to change their behavior in ways most conducive to their own consumption needs and habits. *Id.*

ComEd's AMI Plan does address the type of marketing efforts necessary to have successful dynamic pricing programs (ComEd AMI Plan at 41); the web-portal functionality required for customers to take advantage of dynamic pricing (*Id.* at 50); the interplay with distributed generation (*Id.* at 68); the interplay with storage (*Id.* at 71); and metrics related to dynamic pricing (*Id.* at 75). The Company claims that while a TOU rate – or indeed, any additional dynamic pricing program, even the PTR mandated by law – is not within ComEd's interpretation of the scope of this proceeding, ComEd agrees the goals of these type of rates (including efficiency improvements, lower costs, and improved energy management) are important ones. ComEd Ex. 7.0 at 18. ComEd has agreed to commence a dialog with interested stakeholders including the Smart Grid Advisory Council concerning a TOU rate. *Id.* at 19. The Commission should require ComEd to include in its next annual AMI Plan update filing a TOU rate based on these discussions.

V. CONCLUSION

ComEd's AMI Plan meets the statutory criteria under the PUA for the Commission to approve it, and should be approved. However, the ICC should modify ComEd's AMI Plan to maximize customer benefits through faster deployment of AMI meters, additional dynamic pricing programs and improved distributed generation interconnection procedures. The ICC should also recognize the additional tracking measures agreed to by ComEd at the request of CUB and ELPC, and incorporate those measures in the final AMI Plan.

Respectfully submitted,



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